



Welcome

Droppers

to Apni kaksha



LIVE



LOGARITHM & QUADRATIC EQUATION

① Droppers → 12th

(11th) + (12th) → Light knowledge.

② Deep knowledge Avoid

③ No. of Qs will be high.

④ More Practice ⑤ Still Time

⑥ Last me student 5 Imp chapter

(7) Sheet → Complete / Repeat.

30 chapter → 12 Chapter.
Mastery

(8) Favourite set of Teacher
choose.

(9) A/C/
Algebra गुणित चिह्न next
चिह्न)

LOGARITHM & QUADRATIC EQUATION

B

(10) Drops $\rightarrow$ 96% $\oplus$ / 5000

(11) Quick complete

30 x 6 $\rightarrow$ 180 days
Mid of Dec
Feb
JM1

LOGARITHM & QUADRATIC EQUATION

Basic Maths + Log + Quadratic Eqn.

①

$$(x^2 - 1) = (x - 1)(x + 1)$$

$$(x^3 - 1) = (x - 1)(x^2 + x + 1)$$

$$(x^4 - 1) = (x - 1)(x^3 + x^2 + x + 1)$$

$$(x^7 - 1) = (x - 1)(x^6 + x^5 + x^4 + x^3 + x^2 + x + 1)$$

$$(2) (a-b)^2 + (b-c)^2 + (c-a)^2$$

$$= 2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ca$$

$$\Rightarrow a^2 + b^2 + c^2 - ab - bc - ca$$

$$= \frac{1}{2} \{ (a-b)^2 + (b-c)^2 + (c-a)^2 \}$$

$$(3) a^3 + b^3 + c^3 - 3abc$$

$$= (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

LOGARITHM & QUADRATIC EQUATION

$$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

$$\underline{a^3 + b^3 + c^3 - 3abc} = (a+b+c) \times \underline{\frac{1}{2} \{ (a-b)^2 + (b-c)^2 + (c-a)^2 \}}$$

If $a+b+c=0$
 $\Rightarrow a^3 + b^3 + c^3 = 3abc$

If $\{ (a-b)^2 + (b-c)^2 + (c-a)^2 \} = 0$
 $\Rightarrow a-b=0$ & $b-c=0$ & $c-a=0$
 $\Rightarrow a=b=c$
 $\Rightarrow a^3 + b^3 + c^3 = 3abc$

LOGARITHM & QUADRATIC EQUATION

(4) No. system.

(1) Natural No = $N = \{1, 2, 3, 4, \dots, \infty\}$

(2) Whole No = $W = \{0, 1, 2, 3, 4, \dots, \infty\}$

(3) Integers = $I/Z = \{-\infty, \dots, -3, -2, -1, 0, 1, 2, 3, \dots, \infty\}$

(4) +ve Int = $I^+ = \{1, 2, 3, \dots, \infty\}$

-ve Int = $I^- = \{-1, -2, -3, \dots, -\infty\}$

0 is neither +ve nor -ve Int.

(5) Non-ve Int = $\{0, 1, 2, 3, 4, \dots, \infty\} = W$

LOGARITHM & QUADRATIC EQUATION

(6) Prime No $\rightarrow$ only 2 factors. (Natural No.)

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, ...

Q 673 is a Prime No. or not?

$$\sqrt{673} \approx 26$$

Prime No < 26 search.

2, 3, 5, 7, 11, 13, 17, 19, 23

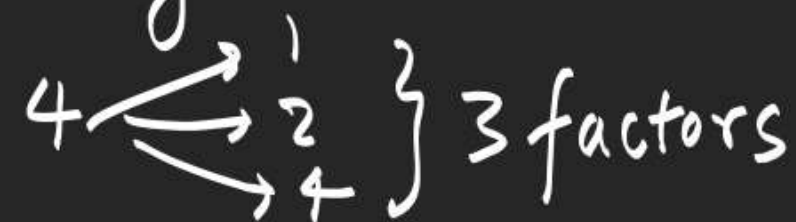
No. divide 673 by each

673 is not div. by any of them.

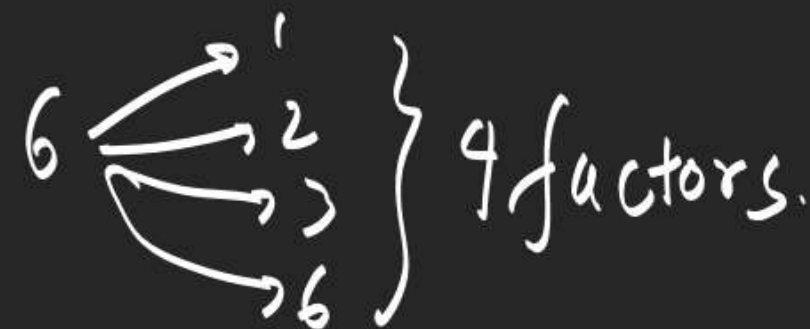
$\Rightarrow$ 673 is Itself a Pr. No.

(7) Composite No.

Having more than 2 factors.



$\Rightarrow$ 4 is a composite



$\Rightarrow$ 6 is a Composite No.

LOGARITHM & QUADRATIC EQUATION

(8) Coprime No / Relative Prime No.

1) 2 Natural No.

2) Having $HCF = 1$

$$HCF(4, 5) = 1$$

4 & 5 are coprime No.

$$HCF(4, 23) = 1$$

4 & 23 are coprime No.

All consecutive Natural Nos are coprime No.

(9) Twin Prime No

1) 2 Prime Nos.

2) having difference = 2

(3, 5) (5, 7) (11, 13) (17, 19)

(2) (2) (2) (2)

are Twin Prime No.

LOGARITHM & QUADRATIC EQUATION

10) Rational / Irr. No.

A) $\frac{p}{q}$ form & $q \neq 0$.

B) After decimal if digit are Repeating = Φ

_____ are Terminating = Φ

_____ are NRNT = Φ'

$$3 = 3.0 = \Phi$$

$$3.\overline{17} = \Phi, \quad 3.\overline{1713} = \Phi.$$

$$3.\overline{666666} \dots = \Phi$$

Repeat

$$3.67125986239 \dots$$

Φ'

LOGARITHM & QUADRATIC EQUATION

R_k :- π & e are 2 special Irr. No.

$$\pi \approx 3.14$$

$$\frac{\pi}{2} \approx 1.57$$

$$\pi^2 \approx 9.86$$

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$

$$(x=1)$$

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \dots$$

$$\sqrt{\text{Prime No}} = \phi'$$

$$\sqrt{2}, \sqrt{3}, \sqrt{5} \dots$$

$$5 \phi$$

$$5.1596 \phi$$

$$5.6666666 \dots \phi [I/F]$$

$$\phi$$

$$e \approx 2.718$$

$$\sqrt{\pi} = \phi'$$

LOGARITHM & QUADRATIC EQUATION

$$1.\overline{3} = \frac{13-1}{\textcircled{9}} = \frac{12}{9}$$

$$1.\overline{32} = \frac{132-1}{99}$$

$$1.\textcircled{72}\overline{33} = \frac{17233-172}{9900}$$

2 digit

$$1.\textcircled{72}33333333$$

LOGARITHM & QUADRATIC EQUATION

$$Q \quad 2 + \sqrt{3} = Q / Q'$$

$$Q' \Rightarrow 2 + \sqrt{3}$$

$$Q + Q' = Q'$$

$$Q' + Q' = Q' [T/F]$$

Not True always.

$$2 + \sqrt{3} + (2 - \sqrt{3}) = 4$$

$Q' \quad \quad Q' \quad \quad Q$

$$Q + Q' = Q'$$

$$Q - Q' = Q'$$

$$Q \times Q' = Q'$$

$$\frac{Q}{Q'} = Q'$$

} Q should not be zero

LOGARITHM & QUADRATIC EQUATION

HCF & LCM

$$1) LCM(2, 4, 8) = 8$$

$$2) LCM(3, 6, 9) = 18$$

$$(3) HCF(3, 6, 9) = 3$$

$$(4) HCF\left(\frac{2}{3}, \frac{4}{5}\right) = \frac{HCF(2, 4)}{LCM(3, 5)} = \frac{2}{15}$$

$$\begin{array}{r|l} 3 & 3, 6, 9 \\ \hline 2 & 1, 2, 3 \\ \hline 3 & 1, 1, 3 \\ \hline & 1, 1, 1 \end{array}$$

$$3 \times 2 \times 3 = 18$$

$$LCM\left(\frac{2}{3}, \frac{4}{5}\right) = \frac{LCM(2, 4)}{HCF(3, 5)} = \frac{4}{1} = 4$$

$$R.K. \pi \neq \frac{22}{7}$$

$$\pi = \emptyset' \text{ But } \frac{22}{7} = \emptyset$$

LOGARITHM & QUADRATIC EQUATION

$$Q. LCM(2, \pi) = ?$$

$$LCM(2, \pi) = 2\pi$$

↓ ↓ (Wrong)

$$LCM(Q, Q') = \text{Not PSBL.}$$

$$Q. LCM(\pi, \pi^2) = ?$$

$$LCM(\pi, \pi^2) = \pi^2$$

$$\frac{\pi^2}{\pi}, \frac{\pi^2}{\pi^2} \Rightarrow \pi, 1 \left\{ \begin{array}{l} \text{Both Answers} \\ \text{are not Integers} \end{array} \right\} \Rightarrow \pi^2 \text{ is Wrong LCM}$$

$$LCM(3, 6, 9) = 9 \text{ Check.}$$

$$\frac{9}{3}, \frac{9}{6}, \frac{9}{9}$$

$$3, \frac{3}{2} \nmid \text{all are not Int.}$$

Wrong LCM

LOGARITHM & QUADRATIC EQUATION

* Product of HCF & LCM = Product of No.

$$HCF(3, 7) = 1$$

$$LCM(3, 7) = 21$$

$$HCF \times LCM = \text{Product of } 3 \text{ \& } 7$$

$$1 \times 21 = 3 \times 7$$

$$21 = 21$$

Q Find Prod of 2 No. in whose HCF
25 & LCM is 5?

Not PSBL

$\Rightarrow$ HCF can't be greater than LCM

LOGARITHM & QUADRATIC EQUATION

Remainder theorem.

Let $P(x)$ be a Polynomial & a is a Real No. ($a \in \mathbb{R}$)

If $P(x)$ is divided by $(x-a)$ then Remainder will be $P(a)$

Q Find Remainder if $x^3 + x + 1$ is divided by $(x-1)$?

$$a=1$$

$$P(x) = x^3 + x + 1$$

$$\text{Rem} = P(1) = 1^3 + 1 + 1 = 3.$$

LOGARITHM & QUADRATIC EQUATION

Q Find Remainder of $x^2 - 3x + 5$ is divided by $(x + 2)$?
 $a = -2$

$$p(x) = x^2 - 3x + 5$$

$$\begin{aligned}\text{Rem} &= p(-2) = (-2)^2 - 3(-2) + 5 \\ &= 4 + 6 + 5 = 15\end{aligned}$$

Q. Find Remainder of $x^2 - 3x + 5$ is divided by $(3x - 4)$?

$$p(x) = x^2 - 3x + 5$$

$$a = \frac{4}{3}$$

$$\text{Rem} \quad p\left(\frac{4}{3}\right) = \left(\frac{4}{3}\right)^2 - 3 \times \frac{4}{3} + 5 = 1 + \frac{16}{9} = \frac{25}{9}$$

LOGARITHM & QUADRATIC EQUATION

Factor Theorem :- If $P(x)$ be a Polynomial of $\deg n \geq 1$

& $(x-a)$ is a factor of Polynomial $P(x)$ then $P(a) = 0$

Q Check whether $(x-3)$ is a factor of $x^3 - 3x^2 + 5x - 7$ or not?

$$a=3$$

$$P(x) = x^3 - 3x^2 + 5x - 7$$

$$P(3) = \cancel{3^3} - 3\cancel{x^2} + 5 \times 3 - 7$$

$$= 8 \neq 0$$

$\therefore (x-3)$ is not a factor

LOGARITHM & QUADRATIC EQUATION

$$\begin{array}{r} 3 \overline{) 4} \quad 1 \\ \underline{3} \\ 1 \end{array}$$

$$4 = 3 \times 1 + 1$$

dividend = divisor $\times$ Quotient + Remainder

$$P(x) = (x-a) \times Q(x) + R(x)$$

$$\begin{array}{r} x-1 \overline{) x^2-x+1} \quad (x \\ \underline{x^2-x} \\ 1 \end{array}$$

$$x^2 - x + 1 = (x-1) \times x + 1$$

$$\underline{Q_{quad}} = (\underline{Linear}) \times \underline{Q(x)} + \text{Constant}$$

LOGARITHM & QUADRATIC EQUATION

Q. If $P(x)$ is divided by $(x-1)$ & Rem is 5. Again $P(x)$ is divided by $(x+2)$ & Rem = -1

then find Rem if $P(x)$ is divided by $(x-1)(x+2)$

$$P(x) = (x-1)Q_1(x) + 5 \longrightarrow P(1) = 5$$

$$P(x) = (x+2)Q_2(x) + (-1) \longrightarrow P(-2) = -1$$

$$P(x) = \underbrace{(x-1)(x+2)}_{Q_3(x)} + (Ax+B)$$

$x=1$

$$5 = 0 \times Q_3(x) + (A+B) \longrightarrow A+B = 5$$

$x=-2$

$$-1 = 0 \times Q_3(x) + (-2A+B) \longrightarrow -2A+B = -1$$

$$3A = 6 \Rightarrow A = 2, B = 3$$

$$\begin{aligned} \text{Rem} &= Ax+B \\ &= (2x+3) \end{aligned}$$

LOGARITHM & QUADRATIC EQUATION

Q If $P(x)$ is divided by $(x-1)$ then $\text{Rem} = 2$ & if it is divided by $(x-2)$

$\text{Rem} = 1$ find Rem if $P(x)$ is divided by $(x-1)(x-2)$?

$$\text{Ans} = \underline{\underline{-x+3}}$$